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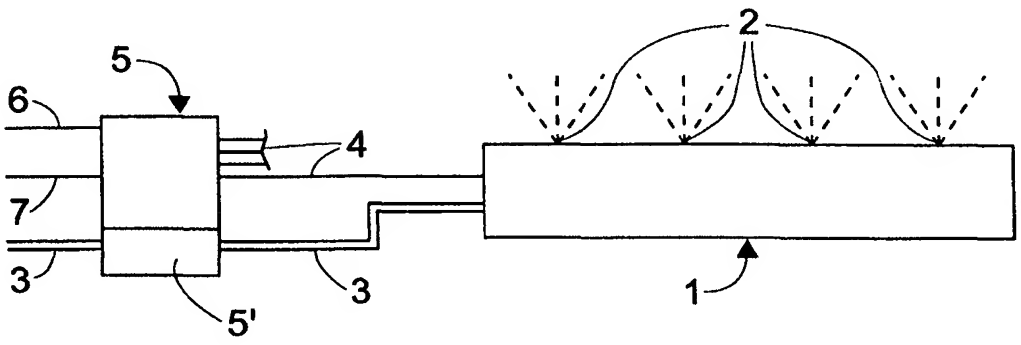
(54) Title: A METHOD AND DEVICE AT A SPRAYING RAMP FOR A PRINTING PRESS



(57) Abstract

In a method for controlling the spraying of fountain solution in a printing press by means of electrically controlled spray valves (2) in a spray ramp (1), the current profile – at the supply of electric pulses to the solenoid of each valve (2) – from the solenoid is fed back to a valve controlling microcontroller (5) for providing an indication of the functionality of the valve.

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A METHOD AND DEVICE AT A SPRAYING RAMP FOR A PRINTING PRESS

Technical Field

The present invention relates to a method and device for controlling the spraying of fountain solution in a printing press by means of electrically controlled spray valves in a spray ramp.

Background of the Invention

As is well known in the art, a spray dampening device in the form of a spray ramp provided with electrically controlled spray valves is used in a printing press for spraying fountain solution on a rotating roller for transfer to a printing plate.

The spray ramp with its valves may be delivered from one source, whereas the control means for the valves may be delivered from another source and combined with the spray ramp at the mounting in a printing press. This means that certain factors of importance for the spray result may not be taken into account.

It may be more advantageous for the customer to buy from a single source an integrated spray process, including the spray ramp with its valves, with an internal feedback of parameters or properties of importance for the spray result, so that the spraying is fully controlled.

The Invention

This may according to the invention be attained in that at the supply of electric pulses to the solenoid of each valve the current profile from the solenoid is fed back to a valve controlling microcontroller for providing an indication of the functionality of the valve. This feedback can be used for diagnosis, for correction and/or for alarm. It provides an important possibility for preventive maintenance and can minimize the number of undesired stops.

Also, the physical properties of the fountain solution fed to the valves can be sensed and supplied to a microcontroller having individual output conduits to the valves and a communication receiver with on/off information, so that an integrated spray process is created.

Normally, the temperature, pressure, and flow of the fountain solution are sensed, as these properties are most influential for the spray result.

Brief Description of the Drawing

The invention will be described in further detail below under reference to the accompanying drawing, in which Fig 1 is a general representation of a first embodiment of the invention at a spray ramp, Fig 2 corresponds to Fig 1 but shows a second embodiment of the invention, Fig 3 is an illustration of a sensor portion to be used at the invention, and Fig 4 graphically illustrates a current signal, a movement of a spray valve plunger induced hereby, and a spray flow profile created by said movement, respectively.

Detailed Description of Embodiments

A spray ramp 1 for a printing press is shown in Figs 1 and 2. The design and function of such a spray ramp is well known in the art, and the ramp is not described in detail herein. Spray valves 2 in the ramp 1 are fed with so called fountain solution through a pipe 3, and the spraying of the fountain solution through the valves is governed by a solenoid controlled plunger in each valve.

Each solenoid is electrically operated through a conduit 4. The current for operating the solenoid may have the appearance of line a) in Fig 4, i.e. a square wave (slightly modified - not shown - with triggering spikes at the ends), where the pulses for opening the valve may have a typical duration of 5 ms and the zero current periods may have a typical duration of 8 ms. The resulting movements of

the valve plunger may have the appearance of line b) in Fig 4, and the spray flow profile from the valves 2 may then be as illustrated by line c) in Fig 4. The normal spray flow profile is thus a series of spray pulses with very short duration, which provides the desired spray result on the roller of the printing press where the ramp is mounted. Each valve 2 is individually controlled, as indicated by the presence in Fig 1 of four conduits 4.

The individual current signal through the conduit 4 is created in a microcontroller 5 having a voltage supply 6 (for example 24 V) and a communication receiver 7 with on/off information for externally activating the microprocessor-based controller 5.

The microcontroller 5 has a sensor portion 5´ (also depicted in Fig 3), in which there are sensors 8, 9, 10 for sensing the temperature, pressure, and flow, respectively, of the fountain solution in the pipe 3. These values are internally fed into the microprocessor of the controller 5 as important control parameters for providing appropriate spray flow profiles for the valves for accomplishing the desired spraying (evenness, distribution, amount, and so on) on the roller in the printing press.

Each microcontroller 5 can in a practical case have eight output conduits 4. Two ramps 1 with four valves 2 each or one ramp with eight valves may thus be controlled.

As a modification of the embodiment shown in Fig 1, the sensor portion 5´ may be arranged in the ramp 1. The sensors 8, 9, 10 are in this case externally connected to the controller 5.

In a second embodiment according to Fig 2, which may be preferred if a self-contained ramp unit is desired, the entire microcontroller with its sensor portion may be arranged inside the ramp 1 in close proximity to the valves 2. Here, the fountain solution pipe 3, the voltage supply 6, and the communication receiver 7 extend into the ramp 1.

An important feature of the microcontroller 5 is the possibility to obtain a feedback regarding the functionality of the plunger in relation to its solenoid in each valve in response to the supplied current profile. The current to the solenoid may for example be measured over a resistor and fed back to the microcontroller 5. If this measured profile differs too much from a preset profile window, it may be taken as an indication of a malfunction. The current profile may be used for diagnosing the function of each valve, so that measures may be taken in time to prevent undesired stops. Alternatively, individual corrections of the current may be made for restoring the function of a valve. Also, an alarm may be triggered at a current profile falling outside given limits. In other words, the working cycle for a valve may be analysed.

CLAIMS

1. A method for controlling the spraying of fountain solution in a printing press by means of electrically controlled spray valves (2) in a spray ramp (1), c h a r a c t e r i z e d in that physical properties of the fountain solution fed to the valves (2) are sensed and supplied to a microcontroller (5) having individual output conduits (4) to the valves and a communication receiver (7) with on/off information, so that an integrated spray process is created.

2. A method according to claim 1, c h a r a c t e r i z e d in that the temperature, pressure, and flow of the fountain solution are sensed.

3. A method according to claim 1, c h a r a c t e r i z e d in that the current profile from the solenoid of each valve (2) is fed back to the microcontroller (5) for providing an indication of the functionality of the valve.

4. A device for controlling the spraying of fountain solution in a printing press by means of electrically controlled spray valves (2) in a spray ramp (1), c h a r a c t e r i z e d by a microcontroller (5) having individual output conduits (4) to the valves (2) and a communication receiver (7) with on/off information and by means (5´, 8, 9, 10) for sensing physical properties of the fountain solution fed to the valves and supplying them to the microcontroller.

5. A device according to claim 4, c h a r a c t e r i z e d in that said means is a sensor portion (5´), through which the fountain solution is supplied and which is provided with sensors (8, 9, 10) for temperature, pressure, and flow.

6. A device according to claim 5, c h a r a c t e r i z e d in that the sensor portion (5´) is arranged in conjunction with the microcontroller (5).

7. A device according to claim 5, c h a r a c t e r i z e d in that the sensor portion (5´) is arranged in the spray ramp (1).

8. A device according to claim 5, c h a r a c t e r i z e d in that both the microcontroller (5) and the sensor portion (5´) are arranged in the ramp (1).

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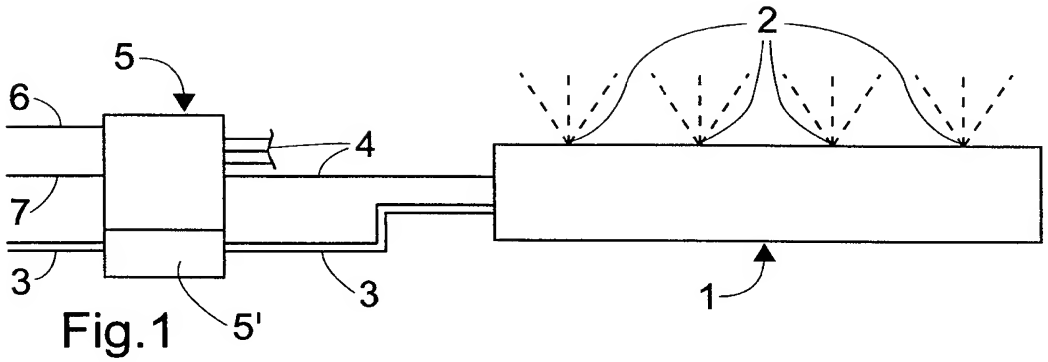


Fig.1

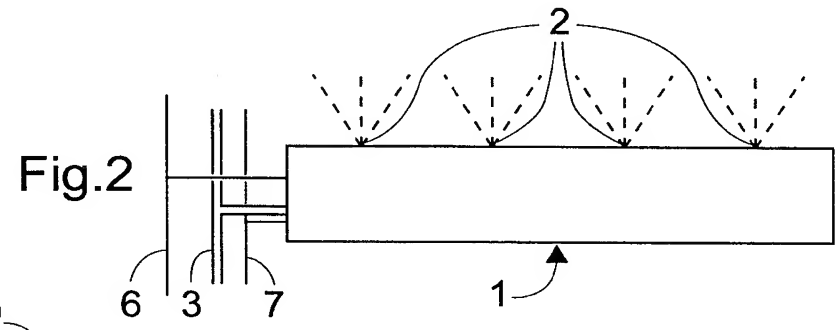


Fig.2

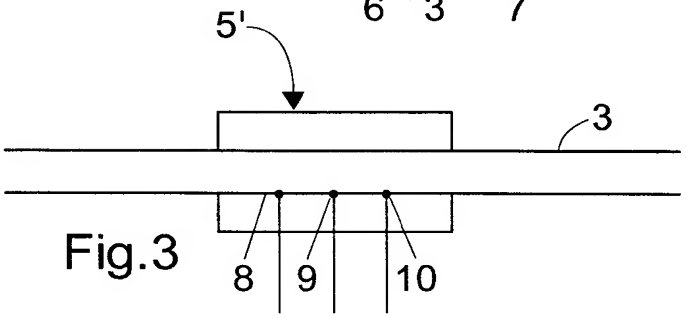
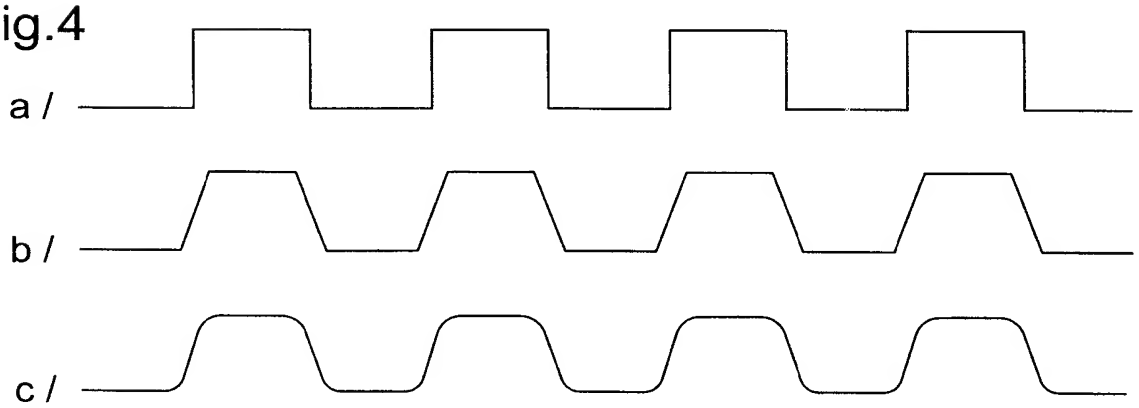


Fig.3

Fig.4



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PCT/SE 99/02172

A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B41F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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